CLAIMS

I claim:

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1. A wavefront modifying device, comprising:

a layer of optical material comprising a monomer and at least one polymerization initiator, wherein the spatial distribution of the index of refraction over a predetermined area of said layer is controlled by the extent of curing of the optical material at each sub-region inside the area.

2. The device in claim 1, further comprising transparent plates wherein said optical material is contained between said plates.

3. The device in claim 2, further comprising a barrier between said plates confining said epoxy within a predetermined volume.

4. The device in claim 1, further comprising a LED array panel having a plurality of LED elements, wherein curing of said epoxy layer is controlled by the irradiating of said epoxy layer with said LED array panel.

5. The device in claim 4, further comprising a control unit controlling the emission intensity and irradiation duration of each LED elements in the LED array panel.

6. The device in claim 5, further comprising a de-magnifier, imaging a predetermined area of the LED array panel onto a predetermined area of the epoxy layer.

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7. The device of claim 1, further comprising a radiation source emitting radiation with at least one wavelength within the absorption band of the polymerization initiator, initiating a polymerization process.

8. The device of claim 1, further comprising a spatial light intensity modulator, wherein curing of the epoxy is controlled by controlling the spatial distribution of the irradiation intensity and exposure duration.

9. The device of claim 8, wherein the spatial light intensity modulator is chosen from a list comprising: (a) LCD array panel, or (b) photographic film, or (c) film with a printed profile for transmitting the irradiation source.

10. The device of claim 1, further comprising a laser unit wherein curing is achieved by directing the beam of the laser at a predetermined area of epoxy layer.

11. The device of claim 10, further comprising a beam scan unit scanning independently in two dimensions addressing any predetermined location at the epoxy layer.

12. The device of claim 11, further comprising an intensity control for the laser unit controlling the intensity and irradiation duration.

13. The device of claim 1, further comprising a radiation intensity monitor unit measuring the spatial distribution of the radiation intensity transmitting through the wavefront modifying device.

14. The device of claim 13, further comprising a computer in a feedback loop, monitoring the radiation intensity, and controlling curing by controlling the intensity and the duration of the radiation exposure.

15. The device in claim 1, wherein said optical material comprises epoxy

16. The device of claim 2, wherein one of the transparent plate has refractive power which can be either positive power, or negative power, with or without cylindrical power.

17. The device of claim 2, wherein the plate can be either rigid or flexible.

18. The device of claim 2, wherein the plate is comprised of salt or other material which is removable by dissolving.

19. A wavefront aberrator, comprising:

a first transparent cover;

a second transparent cover;

a layer of epoxy positioned between said first transparent cover and said second transparent cover and the layer having a pre-determined refractive index profile.